

REMARKS/ARGUMENTS

In response to the Office Action dated February 18, 2004, claims 1 and 8 are amended. Claims 1-8 are now active in this application. No new matter has been added.

The indication that claims 2-7 would be allowable if rewritten in independent form including all the limitations of the base claim and any intervening claims and to overcome noted indefiniteness is acknowledged and appreciated.

REJECTION OF CLAIMS UNDER 35 U.S.C. § 112, SECOND PARAGRAPH

Claims 1-8 are rejected under 35 U.S.C. § 112, second paragraph, as being indefinite. The Examiner maintains that “the engine idle rotation state” recited in claim 1, lines 14-15 and in claim 8, line 15, has insufficient antecedent support. By this response, claims 1 and 8 are amended to recite “*an* engine idle rotation state”. Therefore, it is respectfully urged that the rejection be withdrawn.

REJECTION OF CLAIMS UNDER 35 U.S.C. § 103

Claims 1 and 8 rejected under 35 U.S.C. § 103(a) as being unpatentable over Shimasaki et al. (USPN 6,019,183) in view of Yamaguchi et al. (USPN 5,865,263). The Examiner contends that Shimasaki et al. discloses the claimed invention except for the control of torque absorption by a motor generator. Yamaguchi et al. is relied upon as teaching “that it is known to cancel torque fluctuations due to engine starting when a hybrid vehicle is started from an engine stop state by using a motor/generator to absorb torque. The Examiner maintains that it would have been

obvious to a person of ordinary skill in the art “to modify the control system of Shimasaki et al. so as to control the motor/generator to cancel torque due to engine starting when the vehicle is started from an engine stop state by absorbing torque, as taught by Yamaguchi et al., in order to provide smooth vehicle starting. The cancellation of torque inherently provides the same effective torque for vehicle starting from an engine stop state as from an engine idling state.”

The rejections are respectfully traversed.

The present invention relates to an engine idle stop control system in which the engine automatically stops when a vehicle stops for a moment and automatically starts when the vehicle starts to run.

In this system, when the vehicle starts, the engine starts from an engine stopped state or from the engine idling state. Because of the difference of the real air volume aspirated by the engine in both states, the vehicle starting torque will be different for both states when the vehicle starts to run. More specifically, the real air volume aspirated from the engine stop state is larger than the real air amount aspirated from the engine idling state for the same accelerator depression amount. A vacuum of the intake passage when the engine is stopped is smaller than when the engine is in the engine idling state, then the real intake air amount into the cylinder is increased upon the engine starting from the stopped state. Accordingly, for a common amount of accelerator pedal depression, when the vehicle starts to run from a stationary state by an operator depressing the accelerator pedal, the engine torque will be larger when the vehicle starts from a stationary state in the engine stopped state than when the vehicle starts from a stationary state in the engine idling state.

It is important to note that in the present invention, the engine is always used when the *vehicle* starts to run from the stopped state and the motor/generator is **NOT** used when the

vehicle starts to generate a running torque for the vehicle. In addition, the present invention compensates the torque difference at the vehicle starting from these two states, absorbing starting torque by the motor/generator. The motor/generator functions as a generator to absorb a torque when the vehicle starts to run from the engine stopped state, then both starting torques become equal. The motor/generator does **NOT** absorb the starting torque *when the vehicle starts from the engine idling state*.

Independent claim 1 recites, *inter alia*:

control absorption of torque by the motor/generator so that *a starting torque according to the accelerator pedal depression after restart, is effectively the same torque for vehicle starting from the engine stop state as for vehicle starting from an engine idle rotation state*. (Emphasis Added)

Independent claim 8 has a similar limitation.

Yamaguchi at al. (JP 8-232817) does not disclose the above described technique of absorbing torque when the vehicle starts from the engine stopped state of the present invention. What Yamaguchi at al. discloses is that when a vehicle starts, a drive motor 4 drives the vehicle and when the vehicle speed reaches a certain speed, or at the same time with starting, a motor/generator 3 starts an engine. When the engine starts, a torque generated by the engine is suddenly **added** to the driving torque of the drive motor 4, which appears as a shock to the vehicle driving forth. To absorb this shock in Yamaguchi at al., the drive motor 4 reduces an output torque of the motor at engine starting. The absorbing torque by the drive motor 4 is equal to the engine torque generated, and the drive motor 4 *always reduces the output torque whenever the engine starts*.

However, in the present invention, the motor/generator only absorbs starting torque *when the engine starts from the stopped state upon the vehicle starting from a stationary position*,

and absorbing torque equals a torque difference between the engine starting from a stopped state and the engine starting from an engine idle state. Consequently, the absorbed torque by the motor/generator is **NOT** the engine torque generated itself, as in the case of Yamaguchi et al.

Shimazaki et al. discloses that an engine starts from a stopped state or from an idling state when a stopped vehicle starts (from a stationary position). When a state of a battery charge is at a sufficient level, the vehicle starts to run with a motor and only when the state of the battery charge is not a sufficient level does the vehicle start to run with the engine. The starting torque of the engine from the engine stopped state is different than from the engine idling state, as described above. However, there is no description in Shimazaki et al. to compensate these torque differences when the vehicle starts to run, as in the present invention. While Yamaguchi et al. discloses torque absorption by a motor/generator, the reference does **NOT** absorb torque difference between an engine starting the engine stopped state and engine idling state.

Clearly, the present invention, as recited in claims 1 and 8, is different from what is disclosed in Shimazaki et al. and Yamaguchi et al. Consequently, claims 1 and 8 are patentable over Shimazaki et al. and Yamaguchi et al., considered alone or in combination, and their allowance is respectfully solicited.

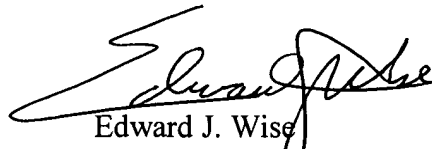
CONCLUSION

Accordingly, it is urged that the application, as now amended, is in condition for allowance, an indication of which is respectfully solicited. If there are any outstanding issues that might be resolved by an interview or an Examiner's amendment, Examiner is requested to call Applicants' attorney at the telephone number shown below.

To the extent necessary, a petition for an extension of time under 37 C.F.R. 1.136 is hereby made. Please charge any shortage in fees due in connection with the filing of this paper, including extension of time fees, to Deposit Account 500417 and please credit any excess fees to such deposit account.

Respectfully submitted,

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